



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/565,042

01/18/2006

Susumu Kawato

10873.1843USWO

3691

52835

7590

03/04/2009

HAMRE, SCHUMANN, MUELLER & LARSON, P.C.

P.O. BOX 2902

MINNEAPOLIS, MN 55402-0902

EXAMINER

AHMED, SHEEBA

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

03/04/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/565,042 | KAWATO ET AL. | |
| | Examiner | Art Unit | |
| | SHEEBA AHMED | 1794 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 11, 2008 has been entered.

Response to Amendment

2. No amendments have been made to claims 4-19. Claims 1-3 are cancelled. New claims 20 and 21 have been added. Claims 4-21 are now pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 4-8 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter

Art Unit: 1794

rejection. No support could be found in the disclosure as originally filed for a residual rate of a surface electric potential of at least 78% after the electret is allowed to stand at 270 °C for 10 min. While there is support in the originally filed specification for the end point of 78% (as well as 88%), no support could be found for the range of "at least 78%" which encompasses values above the maximum disclosed value of 88%.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-8 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koder et al. (US 4,014,091) in view of Felix et al. (US 5,589,558).

Koder et al. teach an electret transducer formed from a resin sheet, such as a polytetrafluoroethylene sheet, adhered to a backplate (column 1, lines 47-61). The backplate may be made of metal, such as aluminum (column 4, lines 44-49).

Koder et al. do not teach that the resin sheet is a modified polytetrafluoroethylene. However, Koder et al. do teach the use of polytetrafluoroethylene as the resin sheet.

Felix et al. teach a polytetrafluoroethylene modified with 0.02-1 wt% of a perfluoroalkyl vinyl ether (abstract). The modification results in a polymer having improved dielectric strength (column 1, lines 41-48).

One skilled in the art would be motivated to use the modified polytetrafluoroethylene as the resin sheet in Koderá et al. because it has improved dielectric strength which will result in an improved electret transducer.

The polytetrafluoroethylene taught by Felix et al. (i.e. polytetrafluoroethylene modified with 0.02-1 wt% of a perfluoroalkyl vinyl ether) should intrinsically possess a residual rate of a surface electric potential after being allowed to stand at 270 °C for 10 minutes of at least 78%. According to the instant specification, PTFE modified with 0.001 to 1.0 mol% of perfluorovinyl ether partially deforms the base crystals of the PTFE with the result that electric charges can be retained more easily (see page 4, lines 11-19). Since the polytetrafluoroethylene taught by Felix et al. has a perfluorovinyl ether content that is completely within the preferred range disclosed by the applicants, it would be expected to possess the same electrical retention properties. Further support for this position can be found in Examples A1 and Comparative Examples A5 in the instant specification. The polymer in Example A1 (PTFE with 0.1 mol% of perfluorovinyl ether) has a comonomer content within the range disclosed by Felix et al. and possesses a residual rate that meets the limitations of claim 4. Conversely, the polymer in Comparative Example A5 (PTFE with 3 mol% of perfluorovinyl ether) has a comonomer content that is outside the range disclosed by Felix et al. and possesses a residual rate that does not meet the limitations of claim 4. Moreover, the limitations of

Art Unit: 1794

claim 6 are taken to be met since dielectric constant and volume resistivity are material properties and the material of Felix et al. appears to be the same as the modified polytetrafluoroethylene of the instant application.

5. Claims 9-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koder et al. (US 4,014,091) in view of Kang et al. (US 6,334,926).

Koder et al. teach an electret transducer formed from a resin sheet, such as a polytetrafluoroethylene sheet, adhered to a backplate at a temperature of 280-400 °C (column 1, lines 47-61). The backplate may be made of metal, such as aluminum (column 4, lines 44-49).

Koder et al. teach neither the water contact angle of the surface of the resin sheet bonded to the metal plate nor that the surface of the resin sheet is subjected to an adhesion-improving treatment.

Kang et al. teach a method for low temperature lamination of a metal to the surface of a fluoropolymer (column 1, lines 8-13). The method comprises subjecting the surface of the fluoropolymer to be bonded to the metal with a plasma pretreatment (column 2, line 55-column 3, line 4). Monomers containing imidazole, epoxide, anioninc, cationic or amphoteric functional groups are then surface grafted onto the pretreated surface (column 4, lines 25-33). The embodiments of the Examples illustrates that pretreatment allows for lamination at a temperature of 120 °C while still resulting in peel strengths of 6-9 N/cm.

Art Unit: 1794

One skilled in the art would be motivated to subject the surface of the resin sheet of Koderá et al. to the treatment regimen of Kang et al. to enable resin sheet and backplate to be bonded together at a lower temperature, thus reducing operating costs.

Regarding the limitation directed to the contact angle of water in claim 9, this limitation is taken to be met since imidazole, epoxide, anioninc, cationic or amphoteric functional groups are polar in nature. Thus, grafting such groups onto the surface of polytetrafluoroethylene would be expected to lower the contact angle of water since water is also polar and would be expected to wet a surface having polar groups grafted thereon. Moreover, since the grafting occurs on the polymer surface at the interface with the selected metal (see column 2, lines 59-65 of Kang et al.) the surface that is not in contact with the metal (i.e. the exposed surface) would be expected to not have a contact angle that has not been lowered. An unaltered PTFE surface would be expected to intrinsically possess a water contact angle of not less than 111° (see Examples B1 to B5 in the instant specification).

The limitations of claims 11 and 17 are taken to be met since dielectric constant and volume resistivity are material properties and the material of Koderá et al. (polytetrafluoroethylene) appears to be the same as the polytetrafluoroethylene of the instant claims 9-19.

Response to Arguments

6. Applicant's arguments filed on December 11, 2008 have been fully considered but they are not persuasive.

Applicants traverse the rejection of claims 4-8 and 20 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement and submit that the claim language merely establishes a minimum residual rate of 78% and that the present claims are no different from the original claims in being generic to the high residual rates. However, the Examiner disagrees. As previously stated, there is support in the originally filed specification for the end point of 78% (as well as 88%), but no support can be found for the range of "at least 78%" which encompasses values above the maximum disclosed value of 88%. Examples A2 reported in Table 1 only supports an end point of 88%.

Applicants further traverse the rejection of claims 4-8 and 20 under 35 U.S.C. 103(a) as being unpatentable over Koder et al. (U.S. Patent No. 4,014,091.) in view of Felix et al. (U.S. Patent No. 5,589,558) and state that Koder fails to address the issue of deterioration of charge retention ability of the electret, and thus cannot suggest a method to improve the residual rate of the electret by using the modified PTFE as claim 4 requires and that Felix fails to address the issue of deterioration of charge retention ability of the electret, i.e., the residual rate, and using modified PTFE for improving the residual rate and that neither reference provides any teaching of how to achieve an improved residual rate. However, this argument is not persuasive given that the charge retention characteristic recited in claim 4 appears to be a material property of the modified PTFE used. According to the instant specification, PTFE modified with 0.001 to 1.0 mol% of perfluorovinyl ether partially deforms the base crystals of the PTFE with the result that electric charges can be retained more easily (see page 4, lines 11-19).

Art Unit: 1794

Since the polytetrafluoroethylene taught by Felix et al. has a perfluorovinyl ether content that is completely within the preferred range disclosed by the applicants, it would be expected to possess the same electrical retention properties. The mere recognition of a latent property in the prior art does not render nonobvious an otherwise known invention.

Moreover, the Examples presented in the specification support the position that the PTFE of Felix et al. would intrinsically possess electrical retention properties that meet the limitations of claim 4. Comparative Examples A4 and A9 are directed to FEP, a copolymer of tetrafluoroethylene and hexafluoropropylene that is not representative of the modified PTFE of Felix et al. (i.e. PTFE modified with 0.02-1 wt% of a perfluoroalkyl vinyl ether). Likewise Comparative Examples A5 and A10 are directed to PFA, a copolymer of tetrafluoroethylene and 3 mol% of a perfluorovinyl ether that is also not representative of the modified PTFE of Felix et al. Conversely, the polymer of Examples A1 and A2, PTFE modified with 0.1 mol% of perfluorovinyl ether, is in the middle of the 0.001 to 1.0 mol% range taught by Felix et al. and possesses electrical retention properties that meet the limitations of claim 4.

Applicants further traverse the rejection of claims 9-19 and 21 under 35 U.S.C. 103(a) as being unpatentable over Koder et al. (U.S. Patent No. 4,014,091) in view of Kang et al. (U.S. Patent No. 6,334,926) and assert that Koder et al. fails to address the issue of surface treatment of the PTFE film or a water contact angle of the surface of the film and that Kang et al. fails to address the issue of the water contact angle of the surface of the film as claim 9 requires and that there is no reasonable basis to combine

Art Unit: 1794

Kodera with Kang to try to improve the electric properties of an electret. However, the Examiner would like to point out that Kang et al. explicitly teach that the method for the modification of their fluoropolymer comprises plasma pretreatment then thermal graft copolymerization "at the lapped interface between the fluoropolymer and the selected metal" (see column 2, lines 59-65). In the embodiments of the examples, assemblies were constructed comprises the graft monomer disposed between PTFE and copper layers which were then sandwiched between stainless steel blocks. That is, the surface of the PTFE opposite the copper layer is not treated with graft monomer but rather is in contact with, and covered up by, a stainless steel block. Therefore, because (1) there is an express teaching to apply the treatment to the lapped interface, (2) there is no teaching to apply the treatment to the surface of the fluoropolymer that is opposite the fluoropolymer/metal interface, and (3) there is no motivation to apply an adhesion promoting treatment to a surface that is not subject to bonding, the applicants arguments are not persuasive and the rejection is maintained.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHEEBA AHMED whose telephone number is (571)272-1504. The examiner can normally be reached on Monday-Friday from 8am to 4:30pm.

Art Unit: 1794

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571)272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sheeba Ahmed/
Primary Examiner, Art Unit 1794